CATERPILLAR

Service Manual

308E2 MINI HYD EXCAVATOR

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Heavy Equipment Manuals

UENR0137 C2.6 and C3.3B Engines for Caterpillar Built Machines ____ 2
UENR4125 Air Conditioning and Heating R134a for All Cat Machines ____ 248

Product: MINI HYD EXCAVATOR
Model: 308E2 MINI HYD EXCAVATOR F8C
Configuration: 308E2 Mini Hydraulic Excavator F8C00001-UP (MACHINE) POWERED BY C3.3B Engine

Disassembly and Assembly
C2.6 and C3.3B
Engines for Caterpillar Built Machines

Media Number -UENR0137-09 **Publication Date -01/08/2015** **Date Updated -14/08/2015**

i05244466

Alternator - Remove and Install

SMCS - 1405-010

S/N - A9W1-UP

S/N - A9Z1-UP

S/N - CE21-UP

S/N - DML1-UP

S/N - EML1-UP

S/N - F8C1-UP

S/N - FHL1-UP

S/N - FMR1-UP

S/N - FTK1-UP

S/N - GBJ1-UP

S/N - GTK1-UP

S/N - H1Y1-UP

S/N - HAM1-UP

S/N - HEL1-UP

S/N - HMR1-UP

S/N - JBE1-UP

S/N - JRD1-UP

S/N - JRF1-UP

S/N - JRS1-UP

S/N - JSL1-UP

S/N - JSN1-UP

S/N - KTS1-UP

S/N - L661-UP

S/N - L771-UP

S/N - L881-UP

S/N - LST1-UP

S/N - MLT1-UP

S/N - MPW1-UP

S/N - NTL1-UP

S/N - PPT1-UP

S/N - RCX1-UP

S/N - SEN1-UP

S/N - STK1-UP

S/N - TAZ1-UP

S/N - TLK1-UP

S/N - WCT1-UP

Removal Procedure

Start By:

A. Remove V belt.

1. Turn the battery disconnect to the OFF position.

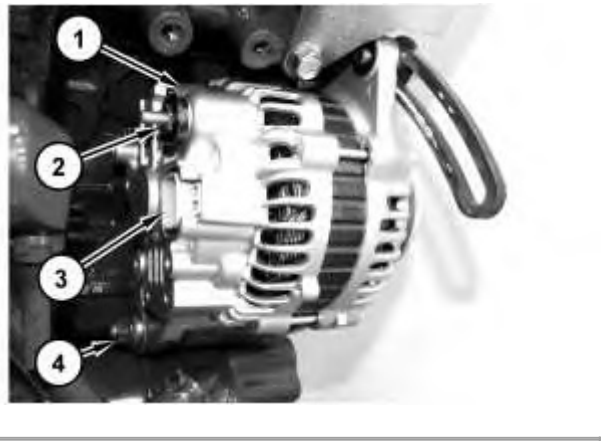

Illustration 1 g02798717

2. Disconnect harness assemblies (2) and (3) from alternator (1) .
3. Remove nut (4) .

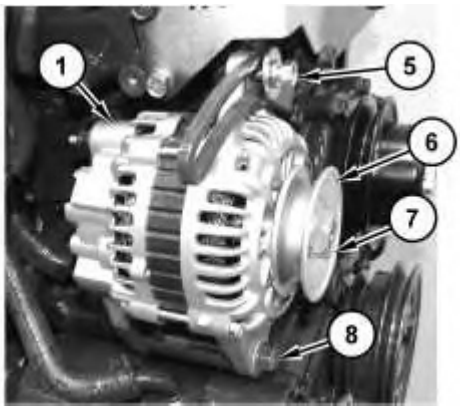

Illustration 2 g02798718

4. Remove nut (7) and pulley (6) .
5. Remove bolts (5) and (6) .
6. Remove alternator (1) .

Installation Procedure

1. Install alternator (1) in the reverse order of removal.

a. Ensure pulley (6) is correctly oriented.

b. Tighten nut (7) to a torque of 58 to 79 N·m (43 to 58 lb ft).

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Disassembly and Assembly
C2.6 and C3.3B
Engines for Caterpillar Built Machines
Media Number -UENR0137-09 **Publication Date -01/08/2015** **Date Updated -14/08/2015**

i05242994

Bearing Clearance - Check

SMCS - 1203-535; 1219-535

Measurement Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	198-9142	Plastic Gauge (Green) 0.025 to 0.076 mm (0.001 to 0.003 inch)	1
	198-9143	Plastic Gauge (Red) 0.051 to 0.152 mm (0.002 to 0.006 inch)	1
	198-9144	Plastic Gauge (Blue) 0.102 to 0.229 mm (0.004 to 0.009 inch)	1
	198-9145	Plastic Gauge (Yellow) 0.230 to 0.510 mm (0.009 to 0.020 inch)	1

Note: Refer to Specification UENR0995 "Engine Design" for non-specified engine Torque Values.

Note: Plastic gauge may not be necessary when the engine is in the chassis.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Caterpillar does not recommend the checking of the actual bearing clearances particularly on small engines. The checking can result in the possibility of obtaining inaccurate information and the possibility of damaging the bearing or the journal surfaces. Each Caterpillar engine bearing is quality checked for specific wall thickness.

Note: The measurements should be within specifications and the correct bearings should be used. If the crankshaft journals and the bores for the block and the rods were measured during disassembly, no further checks are necessary. However, if the technician still wants to measure the bearing clearances, Tooling (A) is an acceptable method. Tooling (A) is less accurate on journals with small diameters if clearances are less than 0.10 mm (0.004 inch).

NOTICE

Lead wire, shim stock or a dial bore gauge can damage the bearing surfaces.

The technician must be careful to use Tooling (A) correctly. The following points must be remembered:

- Ensure that the backs of the bearings and the bores are clean and dry.
- Ensure that the bearing locking tabs are properly seated in the tab grooves.
- The crankshaft must be free of oil at the contact points of Tooling (A).

1. Put a piece of Tooling (A) on the crown of the bearing that is in the cap.

   Note: Do not allow Tooling (A) to extend over the edge of the bearing.

2. Use the correct torque-turn specifications in order to install the bearing cap. Do not use an impact wrench. Be careful not to dislodge the bearing when the cap is installed.

   Note: Do not turn the crankshaft when Tooling (A) is installed.

3. Carefully remove the cap, but do not remove Tooling (A). Measure the width of Tooling (A) while Tooling (A) is in the bearing cap or on the crankshaft journal. Refer to Illustration 1.

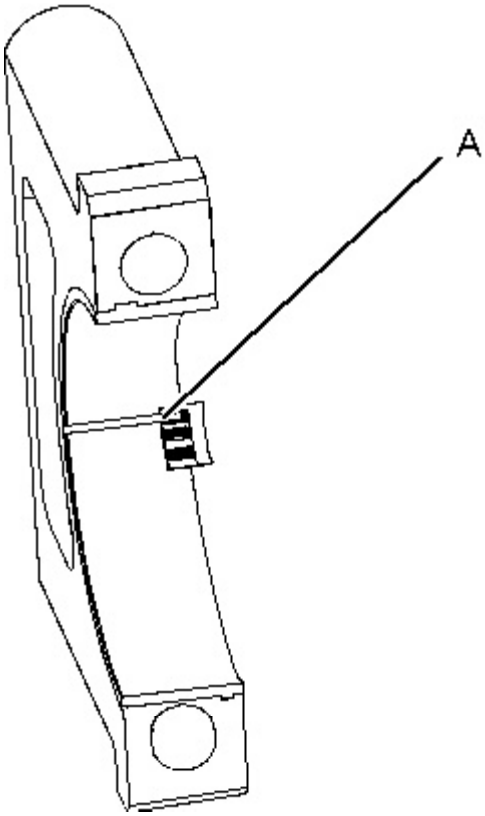

Illustration 1 g01152855

Typical Example

4. Remove all of Tooling (A) before you install the bearing cap.

   Note: When Tooling (A) is used, the readings can sometimes be unclear. For example, all parts of Tooling (A) are not the same width. Measure the major width in order to ensure that the parts are within the specification range. Refer to Specifications Manual, "Connecting Rod Bearing Journal" and Specifications Manual, "Main Bearing Journal" for the correct clearances.

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Product: MINI HYD EXCAVATOR
Model: 308E2 MINI HYD EXCAVATOR F8C
Configuration: 308E2 Mini Hydraulic Excavator F8C00001-UP (MACHINE) POWERED BY C3.3B Engine

Disassembly and Assembly
C2.6 and C3.3B
Engines for Caterpillar Built Machines

Media Number -UENR0137-09 **Publication Date -01/08/2015** **Date Updated -14/08/2015**

i05977048

Bearing Clearance - Check

SMCS - 1203-535; 1219-535

S/N - A9W1-UP

S/N - CE21-UP

S/N - EML1-UP

S/N - F8C1-UP

S/N - FTK1-UP

S/N - HAM1-UP

S/N - HEL1-UP

S/N - HMR1-UP

S/N - JBE1-UP

S/N - JSN1-UP

S/N - KTS1-UP

S/N - MLT1-UP

S/N - MPW1-UP

S/N - PPT1-UP

S/N - STK1-UP

S/N - WCT1-UP

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	198-9145	Plastic Gauge (Yellow) 0.230 to 0.510 mm (0.009 to 0.020 inch)	1

Note: Plastic gauge may not be necessary when the engine is in the chassis.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Cat does not recommend the checking of the actual bearing clearances particularly on small engines. This is because of the possibility of obtaining inaccurate results and the possibility of damaging the bearing or the journal surfaces. Each Cat engine bearing is quality checked for specific wall thickness.

Note: The measurements should be within specifications and the correct bearings should be used. If the crankshaft journals and the bores for the block and the rods were measured during disassembly, no further checks are necessary. However, if the technician still wants to measure the bearing clearances, Tooling (A) is an acceptable method. Tooling (A) is less accurate on journals with small diameters if clearances are less than 0.10 mm (0.004 inch).

NOTICE

Lead wire, shim stock or a dial bore gauge can damage the bearing surfaces.

The technician must be very careful to use Tooling (A) correctly. The following points must be remembered:

- Ensure that the backs of the bearings and the bores are clean and dry.
- Ensure that the bearing locking tabs are properly seated in the tab grooves.
- The crankshaft must be free of oil at the contact points of Tooling (A).

1. Put a piece of Tooling (A) on the crown of the bearing that is in the cap.

   Note: Do not allow Tooling (A) to extend over the edge of the bearing.

2. Use the correct torque-turn specifications in order to install the bearing cap. Do not use an impact wrench. Be careful not to dislodge the bearing when the cap is installed.

   Note: Do not turn the crankshaft when Tooling (A) is installed.

3. Carefully remove the cap, but do not remove Tooling (A). Measure the width of Tooling (A) while Tooling (A) is in the bearing cap or on the crankshaft journal. Refer to Illustration 1.

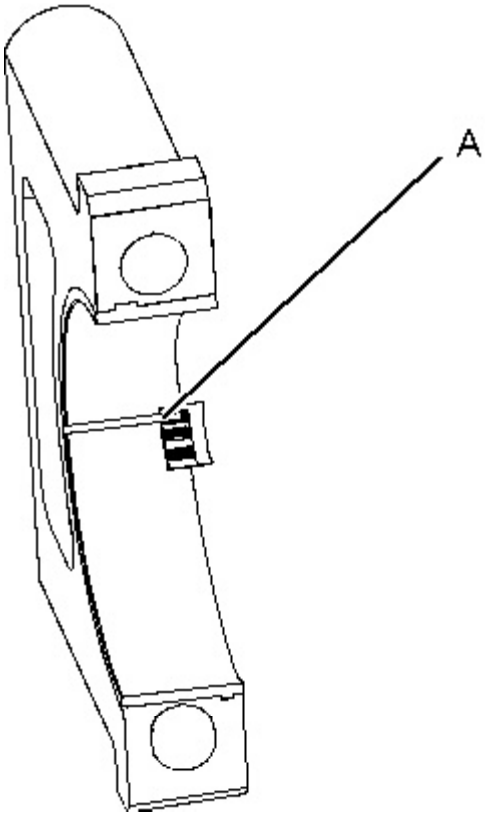

Illustration 1 g01152855

Typical Example

4. Remove all of Tooling (A) before you install the bearing cap.

   Note: When Tooling (A) is used, the readings can sometimes be unclear. For example, all parts of Tooling (A) are not the same width. Measure the major width in order to ensure that the parts are within the specification range. Refer to Specifications Manual, "Connecting Rod Bearing Journal" and Specifications Manual, "Main Bearing Journal" for the correct clearances.

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Product: MINI HYD EXCAVATOR
Model: 308E2 MINI HYD EXCAVATOR F8C
Configuration: 308E2 Mini Hydraulic Excavator F8C00001-UP (MACHINE) POWERED BY C3.3B Engine

Disassembly and Assembly
C2.6 and C3.3B
Engines for Caterpillar Built Machines

Media Number -UENR0137-09 **Publication Date -01/08/2015** **Date Updated -14/08/2015**

i05242597

Bridge Dowels - Remove and Install - C2.6

SMCS - 1100-010

S/N - CE21-UP

S/N - F8C1-UP

S/N - FHL1-UP

S/N - H1Y1-UP

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	5P-0944	Dowel Puller Gp	1

Start By:

A. Remove valve springs of cylinder being repaired.

Note: Refer to Specification UENR0995 "Engine Design" for non-specified engine Torque Values.

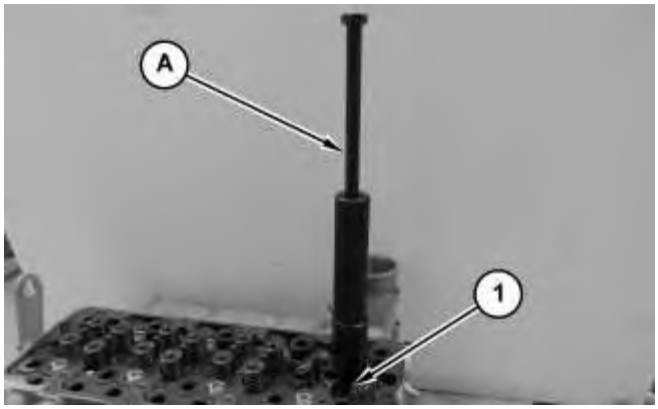

Illustration 1 g03197517

1. Install Tooling (A) and remove bridge dowel (1) .

Installation Procedure

Table 2

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
B	423-9664	Dowel Installer	1

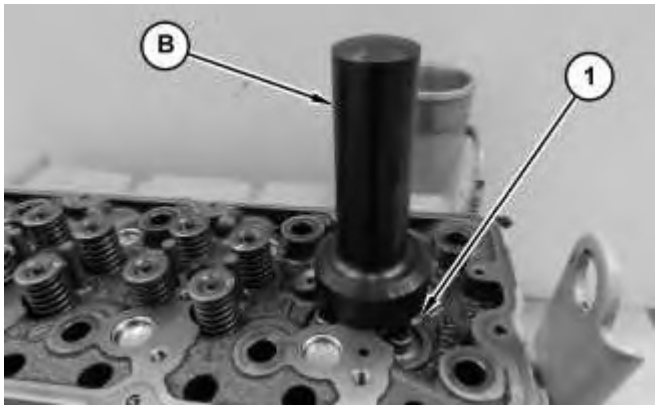

Illustration 2 g03197102

1. Use Tooling (B) and a hammer to install bridge dowel (1) .

End By: Install valve springs of cylinder being repaired.

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Disassembly and Assembly
C2.6 and C3.3B
Engines for Caterpillar Built Machines

Media Number -UENR0137-09 **Publication Date -01/08/2015** **Date Updated -14/08/2015**

i05242591

Bridge Dowels - Remove and Install - C3.3B

SMCS - 1100-010

S/N - A9W1-UP

S/N - A9Z1-UP

S/N - CE21-UP

S/N - DML1-UP

S/N - EML1-UP

S/N - F8C1-UP

S/N - FMR1-UP

S/N - FTK1-UP

S/N - GBJ1-UP

S/N - GTK1-UP

S/N - HAM1-UP

S/N - HEL1-UP

S/N - HMR1-UP

S/N - JBE1-UP

S/N - JRD1-UP

S/N - JRF1-UP

S/N - JRS1-UP

S/N - JSL1-UP

S/N - JSN1-UP

S/N - KTS1-UP

S/N - L661-UP

S/N - L771-UP

S/N - L881-UP

S/N - LST1-UP

S/N - MLT1-UP

S/N - MPW1-UP

S/N - NTL1-UP

S/N - PPT1-UP

S/N - RCX1-UP

S/N - SEN1-UP

S/N - STK1-UP

S/N - TAZ1-UP

S/N - TLK1-UP

S/N - WCT1-UP

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	5P-0944	Dowel Puller Gp	1

Start By:

A. Remove valve springs of bridge dowel being repaired.

Note: Refer to Specification UENR0995 "Engine Design" for non-specified engine Torque Values.

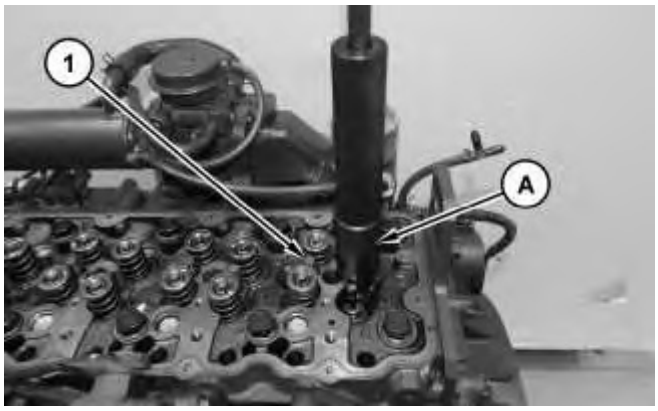

Illustration 1 g02882621

1. Install Tooling (A) and remove bridge dowel (1) .

Installation Procedure

Table 2

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
B	390-1142	Spacer	1

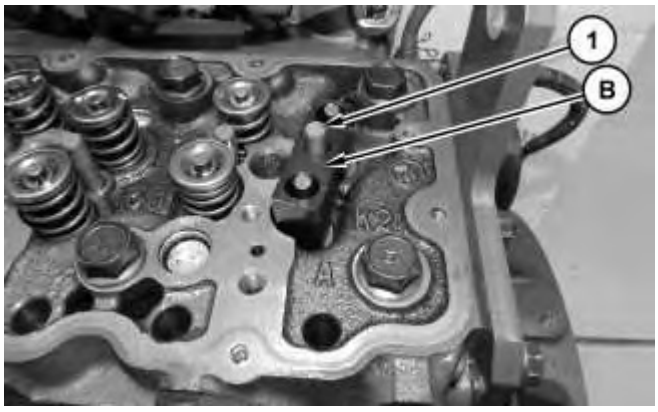

Illustration 2 g02882716

Illustration 3 g02882838

1. Use a press or hammer to drive bridge dowel (1) to a height that is flush with Tooling (B) .

End By: Install valve springs of bridge dowel being repaired.

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Disassembly and Assembly
C2.6 and C3.3B
Engines for Caterpillar Built Machines

Media Number -UENR0137-09 **Publication Date -01/08/2015** **Date Updated -14/08/2015**

i05242928

Camshaft and Valve Lifters - Remove and Install - C2.6

SMCS - 1209-010; 1210-010

S/N - CE21-UP

S/N - F8C1-UP

S/N - FHL1-UP

S/N - H1Y1-UP

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	-	Magnets	8
B	390-1149	Driver	1

Start By:

A. Remove the rocker shaft and pushrods.
B. Remove the flywheel housing.
C. Remove the oil pan. (Only necessary if valve lifters will be removed.)

Note: Refer to Specification UENR0995 "Engine Design" for non-specified engine Torque Values.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

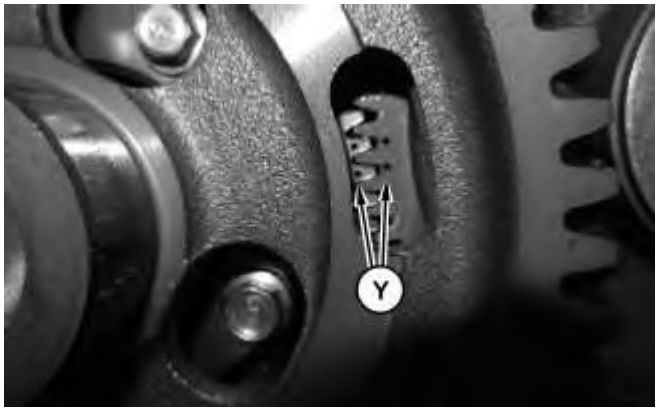

Illustration 1 g03190322

1. Ensure that Timing Marks (Y) on the idler gear and the camshaft gear are aligned. Refer to illustration 1.

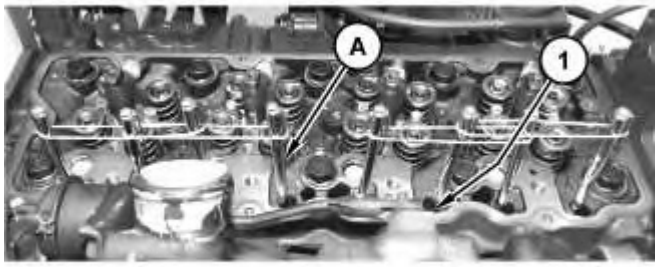

Illustration 2 g02798975

2. Use Tooling (A) to hold up the valve lifters (1) in order to remove the camshaft.

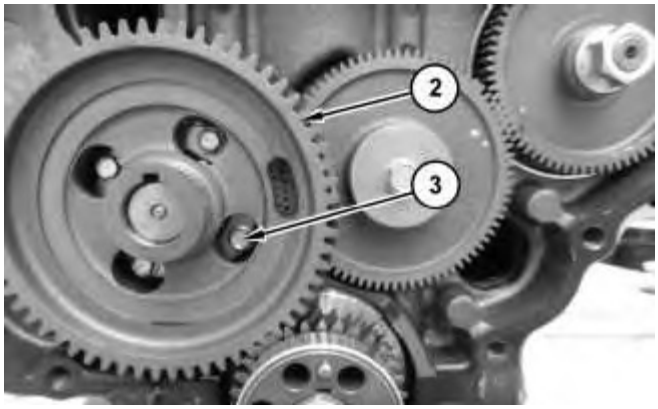

Illustration 3 g03197939

NOTICE

Do not damage the lobes or the bearings when the camshaft is removed or installed.

3. Remove bolts (3) .
4. Carefully remove camshaft (2) from the cylinder block.
5. Remove Tooling (A) . Use a suitable container to catch the valve lifters (1) as the valve lifters (1) slide out the bottom of the cylinder block.

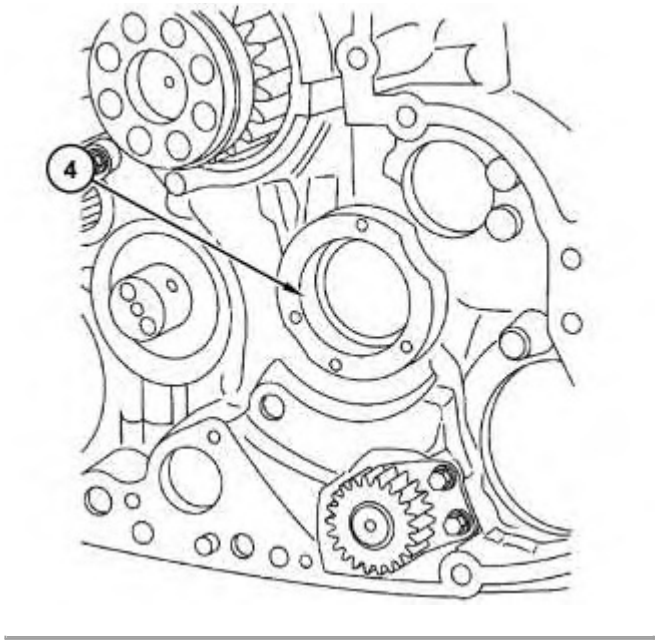

Illustration 4 g02880896

6. Remove the camshaft cover (4) .

Installation Procedure

1. Install camshaft (1) in the reverse order of removal.

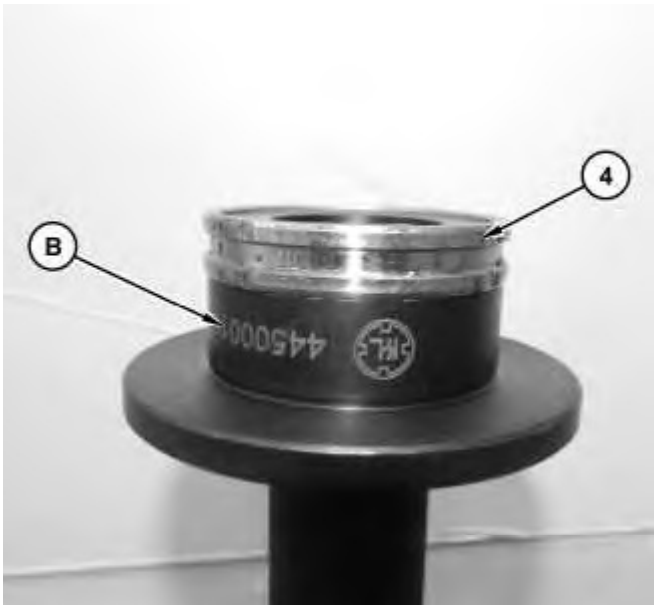

Illustration 5 g02881018

a. Place camshaft cover (4) on Tooling (B) .

Illustration 6 g02881076

b. Use Tooling (B) to install the camshaft cover (4) .

c. Tighten bolts (3) to a torque of 24.0 ± 27.0 N·m (17.70 ± 19.91 lb ft).

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C2.6 and C3.3B
Engines for Caterpillar Built Machines

Media Number -UENR0137-09 **Publication Date -01/08/2015** **Date Updated -14/08/2015**

i05242925

Camshaft and Valve Lifters - Remove and Install - C3.3B

SMCS - 1209-010; 1210-010

S/N - A9W1-UP

S/N - A9Z1-UP

S/N - CE21-UP

S/N - DML1-UP

S/N - EML1-UP

S/N - F8C1-UP

S/N - FMR1-UP

S/N - FTK1-UP

S/N - GBJ1-UP

S/N - GTK1-UP

S/N - HAM1-UP

S/N - HEL1-UP

S/N - HMR1-UP

S/N - JBE1-UP

S/N - JRD1-UP

S/N - JRF1-UP

S/N - JRS1-UP

S/N - JSL1-UP

S/N - JSN1-UP

S/N - KTS1-UP

S/N - L661-UP

S/N - L771-UP

S/N - L881-UP

S/N - LST1-UP

S/N - MLT1-UP

S/N - MPW1-UP

S/N - NTL1-UP

S/N - PPT1-UP

S/N - RCX1-UP

S/N - SEN1-UP

S/N - STK1-UP

S/N - TAZ1-UP

S/N - TLK1-UP

S/N - WCT1-UP

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	-	Magnets	8

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